Liverpool John Moores University

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Title:	Computer Audio Technology
Status:	Definitive
Code:	**4500AMPCC** (127597)
Version Start Date:	01-08-2021
Owning School/Faculty:	Engineering
Teaching School/Faculty:	Coleg Cambria

Team	Leader
Martin Hanneghan	Y

Academic Level:	FHEQ4	**Credit Value:**	20	**Total Delivered Hours:**	57
Total Learning Hours:	200	**Private Study:**	143		

Delivery Options
Course typically offered: Semester 1

Component	Contact Hours
Lecture	22
Practical	22
Tutorial	11

Grading Basis: 40 %

Assessment Details

Category	Short Description	Description	Weighting (%)	Exam Duration
Exam	AS2	Examination	50	2
Artefacts	AS1	Production of an audio book	50	

Aims

To explain how computers capture, process and store digital audio and performance data and explore the systems used to enable this. To illustrate the hardware and software that is used in computer-based audio and music production. To explore the techniques used to edit and manipulate digital audio and musical performance data.

To utilise the various activities and skills required during the typical workflow stages of computer-based audio production.

Learning Outcomes

After completing the module the student should be able to:

1	Recognise and define the primary components of a computer-based audio production environment.
2	Define the techniques used for manipulating both digital audio signals and digital performance data and formulate an appropriate workflow to enable this manipulation to take place.
3	Examine the practical role of audio hardware and software components in computer-based DAWs.
4	Demonstrate a range of audio editing and production techniques to develop custom audio solutions.

Learning Outcomes of Assessments

The assessment item list is assessed via the learning outcomes listed:

Examination	3	2	1
Production of an audio book	4	3	

Outline Syllabus

The physical properties of sound
Number bases, audio and computing architectures
Computer audio technology: interfaces and I/O
The workflow of computer audio production
Introduction to Pure Data: programming audio applications
Digital Audio Workstations (DAWs)
Sampling theory and practice: Analogue to digital conversion
Digital to analogue conversion
Digital audio editing techniques
Understanding and analysing audio: deconstruction
Fundamentals of sound synthesis; ADSR envelopes, LFOs, additive synthesis, AM and FM synthesis
Subtractive synthesis and wavetables
The MIDI protocol, MIDI devices and control
Sequencing and MIDI programming
Digital Signal Processing (DSP), effects and filters
Plug-ins and virtual instrument technologies
Advanced digital audio editing techniques
Spectrum analysis and audio visualisation
Multichannel audio and surround sound placement
Time codes and synchronisation
Intermediate audio programming concepts in Pd

Developing a complete virtual instrument with Pd

Learning Activities

Lectures will be accompanied by workshop-based demonstration sessions and hands-on practical sessions. Theoretical knowledge will be assessed in guided tutorial sessions. Canvas will be used to provide additional reading resources and example source code and audio files.

Notes

This module investigates how computers capture, process and store digital audio data. This can include sampled sound and performance data in the form of MIDI. Some introductory audio programming skills are developed during the module to allow students to process audio data with computer software. Practical experience of using DAW systems to create audio projects is provided.